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ABSTRACT

The major objective of this study was to determine whether a relationship existed between eleventh-grade biology students' attitude toward science and environmental concepts and their exposure to field trip activities. All students in the sample were using the Biological Sciences Curriculum Study (BSCS) textbook, Green Version. The study was successful in establishing that such a relationship exists. Statistically significant differences in student attitude between pretest and posttest measurements after varying amounts of field work during the 15-week study period were shown. (Author/RE)

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INFLUENCE OF THE AMOUNT OF TIME SPENT IN FIELD TRIP ACTIVITIES ON STUDENT ATTITUDE TOWARD SCIENCE AND THE ENVIRONMENT

Gerald T. Ignatiuk

S.S.T.A. Research Centre Report No. 49

A report with recommendations prepared under the auspices of the Saskatchewan School Trustees Association Research Centre.

March, 1978

Note: The opinions expressed in this report are those of the author and may or may not be in agreement with SSTA officers or trustees, but are offered as being worthy of consideration by those responsible for making decisions.

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THE RESEARCH CENTRE
SASKATCHEWAN SCHOOL TRUSTEES ASSOCIATION
570 AVORD TOWER, REGINA, SASKATCHEWAN

SE 029 369

BIOGRAPHICAL SKETCH

Born at Preeceville, Saskatchewan, the investigator completed elementary education at Stenen and Preeceville and secondary education at Preeceville High school graduating in 1968. Mr. Ignatiuk attended the University of Saskatchewan (Regina Campus) completing the requirements of the degree Bachelor of Education with Distinction (major in biology) in 1972.

Mr. Ignatuik taught biology, chemistry, geography and general science at the Pelly High School for the school terms 1972-73 and 1973-74. He received a year's leave of absence from the Kamsack School Unit #35 for the school term 1974-75 in order to begin graduate work at the University of Regina. He returned to teach at Pelly High School for the school terms 1975-76 and 1976-77. Mr. Ignatiuk completed requirements for the degree Master of Education (Science Education) in 1977.

Mr. Ignatiuk was responsible for the writing of a manual used the past three years in a major outdoor-biology program for the Pelly High School. He has been active as a hockey referee, baseball and football coach and umpire. He has also gained experience in many other work areas, hobbies and activities. Mr. Ignatiuk is not yet married.

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A. THE MOST SIGNIFICANT FINDING AND/OR IMPLICATION OF THE STUDY

The major objective of this study was to determine whether a relationship existed between Grade XI BSCS[1] Green Version biology students' attitudes toward science and certain environmental concepts and their exposure to field trip activities. The study was successful in establishing that such a relationship existed.

Statistical analyses showed that significant differences in students' attitudes existed between pre-test and post-test measurements, when students having participated in varying amounts of field work during the study interval (15 weeks) were compared to those students having not participated in field work during that interval.

B. PURPOSE OF THE STUDY

A number of sources indicated that emphasis has been placed on development of scientific attitudes and on field work within the science, biology. The amount of expressed opinion, or only weakly supported evidence, of field trip values is abundant. However, there has been relatively little research done into the value of field trips as they relate to attitudes toward science and the environment.

The Province of Saskatchewan has also seen and encouraged a movement toward greater use of the outdoors. The writer thus posed the question - is there a relationship between field work and students' attitudes toward

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[1] BSCS refers to the Biological Sciences Curriculum Study, P.O. Box 930, Boulder, Colorado, 80302 (Canadian distribution from Gage Educational Publishing Ltd., P.O. Box 5000, Commander Blvd., Agincourt, Ontario). There are three similar editions of BSCS Biology (Green Version) - Biological Science: An Ecological Approach, 1973 (3rd. ed.); High School Biology, 1963 (2nd. ed.), 1958 (1st. ed.); Gage, Agincourt, Ontario.

science and certain environmental concepts? Establishing an answer to such a question, the writer felt, would have ramifications for both teachers and administrators of schools.

A number of specific problems were derived from the purpose. These problems were stated as follows:

1. To determine whether exposure to field trip activities is related to a change in students' attitudes toward science and toward certain environmental concepts.
2. To determine whether the number of days of exposure to field trip activities is related to a change in students' attitudes toward science and toward certain environmental concepts.
3. To determine whether the students' place of residence (urban or rural) is related to their attitudes toward science and toward certain environmental concepts.
4. To determine whether the sex of students is related to their attitudes toward science and toward certain environmental concepts.

C. PROCEDURE AND SAMPLE USED

Examination of Department of Education statistics showed that 105 schools in the province offered BSCS Biology (Green Version) in the eleventh and twelfth grades during the 1974-75 school year. Because the BSCS Biology (Green Version) course was ecology-based and because specific provision was provided for field trips within the portion of the course designated for Grade XI, schools offering this course were considered to be more appropriate to the study than schools offering other biology programs. A sample of 40 schools that seemed appropriate to the study was obtained, upon examination of the results of a questionnaire sent to all schools.

The test instruments chosen had to be able to measure attitudes that may have been influenced by field trip work. The instruments considered

most applicable to the design of the study were the following:

1. The Cross Regional Environmental Attitude Survey
2. Scientific Attitude Inventory

(Copies of both these instruments may be seen in the Appendix.)

The tests could be used in a pre-test, post-test design. Students were required to indicate their response to each of the statements in each of the instruments, on a scale ranging from strongly agree to strongly disagree. The results for each student could then be scored by assigning numbers to the letter responses and providing a total score for each instrument. Each instrument had a total possible score and the closer the student score approached the maximums possible, the more positive were the students' attitudes toward science or certain environmental concepts; depending upon which instrument was being viewed.

Packets containing copies of the instruments, instructions, answer booklets, return envelopes and so on were sent to each school before classes began for the new school term (1975-1976). The biology teacher(s) administered the instruments and returned all materials to the writer (upon this first administration all but three schools returned the materials). Similar packets were sent out again, to be administered fiften weeks after the first administration (again all but three schools returned the materials). The researcher was left with the results of 34 schools, a total of 1378 students.

The papers were then paired (pre and post) for each student, coded and scored according to the instructions of the authors who had developed each of the instruments. To facilitate analysis, the information was appropriately coded onto computer cards. The information included student number, school number, number of days spent in the field, sex, residence location and the scores obtained on each instrument administration.

The quantitative results were then subjected to computer programs that provided means, standard deviations, correlations, correlated t-tests and analysis of covariance.

The qualitative information that was obtained in the final administration of the instruments was examined in an attempt to view commonalities that existed in the schools used. It was reasoned that the teacher variable might be of somewhat less concern if statements with respect to information requested were similar between schools. The information that had been requested included the number of days of field trips taken, the dates of their field trips and, very importantly, the objectives they had set for the field trips.

Schools were found to have taken 0, ½, 1, 2½, 3, 5, or 14 days of field trips.

D. MAJOR FINDINGS

Analysis of covariance was used to compare the non-treatment groups (0-day field trip) to the groups receiving some amount of treatment (½ - 14-days of field trip activities). The results showed that for both instruments the differences between the adjusted group means were significant (.05 level). Therefore exposure to field trip activities was related to a change in students' attitudes toward science and toward certain environmental concepts.

The differences between the pre-test scores and post-test scores generally increased for both of the test instruments as the number of field trip days increased beyond 2½-days. In each field trip day category the percentage differences illustrated that the differences varied as the number of field trip days varied. Correlation coefficients were calculated for the total sample between a number of the variables and means obtained on the test instruments. Most noteworthy were the relatively high corre-

lations - .57 for the Cross Regional Environmental Attitude Survey and .35 for the Scientific Attitude Inventory - that existed between the number of days spent on field trips and the difference between pre- and post-test scores on each of the test instruments. Correlated t-tests were employed to analyze the significance of the obvious differences that existed between the pre- and post-test results for both test instruments for most of the field trip day categories. All the differences in means observed for the Cross Regional Environmental Attitude Survey were significant (.05 level). For the Scientific Attitude Inventory all the differences in means observed for the 2½-day category and beyond were significant (.05 level). Therefore, the number of days of exposure to field trip activities was related to a change in students' attitudes toward science and toward certain environmental concepts.

Analysis of covariance was used to compare all urban students to all rural students of the total sample for both test instruments. For both test instruments the difference between the adjusted group means was not significant (.05 level). Further analysis of means of subgroups indicated that only very small differences were present between the urban and rural groups. Therefore, the students' place of residence (urban or rural) was not related to their attitudes toward science and toward certain environmental concepts.

Use of the analysis of covariance to compare all male students to all female students of the total sample for both test instruments showed no significant (.05 level) difference between the adjusted group means for either test instrument. The differences between male and female students in both pre-test and post-test situations tended to be even smaller than in the comparison of the urban and the rural dichotomy, for both test instruments. Generally, the females had a slightly higher mean score than

males. Therefore, the sex of students was not related to their attitudes toward science and toward certain environmental concepts.

The qualitative information collected was summarized as to the type and objectives of the field trips conducted in the participating schools. Most noteworthy would be that it appeared schools conducting longer or more frequent field trips had also spent more time in general preparation, in development of indepth objectives and in follow-up activities in contrast to the schools spending much less time at field trips, preparation and follow-up and who were 'fun trip' oriented. This of course in relation to the quantitative data leaves an impression that the teachers may also be contributing to attitude changes as well as the presence, absence or number of days of field trips.

E. CONCLUSIONS

Students' attitudes toward science and certain environmental concepts were significantly more positive after they had been exposed to at least 2½ days of field trip activities. The optimum would appear to be about 5 days, as the percentage increase difference between the 5-day group and 14-day group is much smaller than the differences noted between the 2½-day group and the 5-day group. It is evident from the findings of the study that field trips of certain intensities are desirable in terms of the attitudes of students involved in the study. Whether such results can be expected for all types of students and for all types of schools is beyond the scope of this study. The schools showing such favorable results by their programs may well be the lighthouse that other schools should be using as a guide. However, it has been recognized that the schools with such positive outcomes in their students' attitudes also have a relationship evident in certain procedures followed for their field trips, that may be attributable to certain teacher characteristics. Until such teacher characteris-

tics are identified and assessed as to whether other teachers can gain these characteristics, it may be with some doubt that schools be encouraged to increase the number of field trips in their classes. This suggests that further research attempt to separate the effect of field trips from whatever effect, if any, that teachers themselves are having on students' attitudes, when the students are exposed to field trips.

The BSCS Biology course certainly encourages the use of field trips and if teachers are not using them, then one might well question whether they are really in tune with the philosophy. Whether this lack of alignment with the philosophy of the BSCS curriculum is because of inadequate preparation or refusal to accept it is questionable. There may well be value in attempting to examine the outcomes (as viewed in this study) of the other major acceptable biology course in the Province of Saskatchewan. However, it appears field trips do contribute to students' attitudes toward science and certain environmental concepts.

Such variables as students' place of residence or sex does not significnatly relate to the attitudes of the students, as measured. These results confirm most other similar attempts to examine whether such relationships exist, except that there have been some studies that have shown females to have a significantly more positive attitude toward the environment than males. In the present study, the females showed a trend (though not significant) to having a slightly more positive attitude toward science and the environment than the males.

The fact that this study has indicated a relationship between field trips and the number of field trip days, to students' attitudes toward science and certain environmental concepts, should be considered by schools or school systems when planning to expand upon the field components of at least their BSCS Biology courses. Field trips may not be totally responsi-

ble for increases in positive attitudes, but indications are that they should receive consideration as to use. Teachers will have to be assessed as to their capability of conducting quality field trips.

F. IMPLICATIONS AND RECOMMENDATIONS

If one accepts as a reasonable endeavour and worthwhile purpose the development of positive student attitudes toward science and the environment, then further research into the variables that are most contributory to this end is necessary. If field trips are providing an avenue of information regarding the environment that is fostering positive attitudes, then an attempt must be made to identify just what this information is. It may then be possible to apply some method of in-classroom-teacher-strategy which would be as successful in achieving the type of positive attitudes noted in students that experienced field trips. The writer has recognized the fact that the information is not yet known. The study also had its limitations, such as the following: the study did not consider field trips that may have been taken in other classes by the same students in the same time interval; specific methods (eg. use of films vs. field trips) were not compared as to their influence on students' attitudes; and the study was conducted over a relatively short time. However, certain recommendations are suggested from the data available. These recommendations are:

(a) Teachers involved with the BSCS Biology course should examine the number of field trips they have taken and consider further utilization of the out-doors. Some teachers may require further training to become adequately prepared to confidently conduct field trips;

(b) School administrations should encourage the use of the field trip teaching method. Budget increases may be required for necessary equipment, travel and teacher inservice;

(c) Researchers and organizations that help fund research should encourage more work in the area of examining field work and its relevance to affective learning.

Further research topics suggested as a result of the present study are summarized below:

(a) The possible contribution teachers may be making to the attitudinal outcomes of students exposed to field trips during their Grade XI BSCS Biology course;

(b) A comparison of students' attitudes, as measured in the present study, over a longer period of time than the approximate fifteen weeks considered in the present study;

(c) The relationship, if any, that exists in attitudinal outcomes of students exposed to field trips during their Grade XII BSCS Biology course;

(d) The development and field test of an attitude instrument that would be more specific with regard to Saskatchewan's environment, schools and programs;

(e) A comparison of students' attitudes on a pre- and post-test situation, when they are exposed to field trip activities in the other major biology course of the province;

(f) A comparison of students' attitudes on a pre- and post-test situation, when they are exposed to field trip activities at other grade levels (for example the Grade VII life science course);

(g) The causal relationship of field trips to science and environmental attitude and what is being done to foster appropriate approaches in teachers with regard to efficient use of field trips.

APPENDIX

Instrument Samples

GENERAL INSTRUCTIONS:

1. Do all parts in pencil.
2. Complete all questions on the next page(s) with reference to your name, age, home area and so on.
3. There are two sets of 60 statements to which you will be asked to respond. There are no correct answers, so that you answer according to how you feel about each statement. Answer all statements, as this is not a speed test (generally, it will take you nearly an hour to complete both sets of statements).

   On the separate answer sheet find the row which has the same number as the statement you are answering. In that row blacken the space with the letter which is the same as the one that corresponds to the answer you wish to give for that statement of that particular statement set.

   Make your marks heavy and black. If you wish to change an answer be sure and completely erase the previous answer.
4. Do not mark anything on the sheets containing the statements and DO NOT make extra marks on the answer sheets.
5. Check frequently to be sure your answer numbers and statement numbers match.
6. Ask your teacher if you do not understand how to do something.

CROSS-REGIONAL

ENVIRONMENTAL ATTITUDE SURVEY

TO THE STUDENT:

We want to know what you think about your environment and some of the environmental conditions we live in today. That is why we would like for you to read the statements in this survey and respond to each by marking one of the following

reactions: strongly agree, agree, undecided, disagree, or strongly disagree. Please do not omit any item. Make one response for each item.

SAMPLE:

1. Man has altered the natural environment in the course of his activities.

Strongly disagree - A block
Disagree - B block
Undecided - C block
Agree - D block
Strongly agree - E block

ANSWER SHEET

1. (A) (B) (C) (D) (E)

In this sample, the student is undecided.

1. Individuals tend to select quick money gains, which often causes greater long periods of environmental damage.
2. Scenic areas and recreational facilities are becoming more important in leisure-time activities and natural enjoyment.
3. The possible decisions available to future generations must not be made impossible now.
4. Water supplies, both in quantity and quality are important to all levels of living.
5. Man's need for food, fiber, and minerals increases as populations expand and levels of their use rise.
6. Minerals are nonrenewable resources.
7. Individual citizens should be stimulated to become well informed about resource issues, problems, management procedures, and ecological principles.
8. The speed of change in an environment is the same as the speed of change to which a plant or animal is able to adjust.

9. Social changes (how man lives together) and technological changes (the way man uses things) do not change the use and value of natural resources.
10. The size and range of species and their populations is determined by surrounding conditions (both living and non-living), and by their action on each other.
11. As populations increase and/or as resource supplies decrease, the freedom of the individual to use the resources as he wishes decreases regardless of the kind of government present.
12. We are unable to make new plans that would slow down the "using up" of natural resources.
13. Long range planning for the use and assignment of natural and human resources is continually developing.
14. Individual citizens should be stimulated to become active in the political process.
15. We have "legal" ownership of some resources like real estate and control over others during our lifetime, but ethically we are "stewards" rather than owners of the resource base.
16. Opportunities to experience and enjoy nature are psychologically rewarding to many and are important to mental health.
17. Increasing human populations, rising levels of living, and the demands for greater factory and farm production causes greater environmental contamination (pollution).
18. Over a period of time, the economy of a region depends on the use of its natural, human, technical, and cultural resources.
19. The increased ability for the population to move about is changing the kinds of demands man has upon some resources.

20. Man is developing the ability to work with others and improve the skills needed to control population growth, change environments, and alter resource use patterns.
21. Living things are not dependent on each other and their environment.
22. A knowledge of the sciences of how man lives together (social), works (physical), functions (biological), and his art, philosophy and values (humanities), are important for environmental understanding.
23. Geological processes like erosion and deposition modify the landscape.
24. Man is not influenced by many of the same hereditary and environmental factors that affect other organisms and their populations.
25. Family planning and the limiting of family size are important if overpopulation is to be avoided and a reasonable standard of living assured for successive generations.
26. Controlling the environment has effects on individual people and on man's institutions such as school, law, church, etc.
27. Natural resources, water and minerals in particular, are equally distributed with respect to land areas and political boundaries.
28. There are certain risks and certain limits experienced, when man tries to control the natural environment.
29. All living things, including man, are continually changing as part of their evolution.
30. Goods and services are produced by the way labor, money, natural resources and our ability to make things affect each other.
31. Pollutants and contaminants are not produced by natural and man-made processes.
32. Water is a reusable and moving resource, but the available quantity and its quality may be reduced.

33. Green plants are the ultimate sources of food, clothing, shelter, and energy in most societies.

34. Some basic resources are renewable and can be extended by reproduction, growth, and management.

35. Our ability to produce and create wants, and thus greater markets, constantly expands our practice of consuming (using up) things, which in turn changes the speed of resource use.

36. Mineral conservation involves the utilization of all known methods of using the minerals of the earth's crust that will cause them to serve more people for a longer time.

37. Most resources can not be reduced in quantity or quality.

38. The control of our environment does not require the use of knowledge from many different places and people.

39. Economic efficiency (getting the most for our money) guarantees the conservation and best use of a natural resource.

40. Conflicts come about between the right to use private land as one sees fit and the maintenance of a good environment for all of the public to enjoy.

41. Modern tranportation, growing interest, money surpluses and increased leisure time combine to create heavy pressures on existing recreation facilities and demands for new ones.

42. An organism is the product of its heredity and environment.

43. Conservation responsibilities should be shared by individuals, businesses and industries, special interest groups, and all levels of government and education.

44. As populations increase competition for the use of water increases resulting in a need for establishing water use priorities.

45. Conservation policies are often the result of group action.
46. Man has affected the way plants and animals live and has affected the things that happen in their environment.
47. In any environment, one component like space, water, air, or food may become a limiting factor.
48. A variety of institutions such as the school, home, government, clubs, etc., are involved in planning and managing the environment.
49. An individual must develop his ability to see what is happening if he is to increase his awareness and develop environmental understanding.
50. One land-use practice is to use certain areas of land in two or more different but compatible (well-matched) ways.
51. Outdoor recreation is an increasingly important part of our culture and cur economy.
52. The earth and life on it are not greatly affected by the atmosphere.
53. Wildlife populations are important economically, and biologically, and because of their natural beauty and value.
54. Man has no moral responsibility for his environmental decisions.
55. The culture of a group is its learned behavior in the form of customs, habits, attitudes, institutions, and lifeways that are transmitted to its progeny.
56. Man has responsibility to develop an appreciation of and respect for the rights of others.
57. Plants are renewable resources.
58. Safe waste disposal, including the reduction of harmful and cumulative effects or various solids, liquids, gases, radioactive wastes and heat, is important if the well being of man and the environment is to be preserved.

59. When man wants the number of a certain animal to increase, a good way to do this is to manage (control) the natural places where it lives.

60. We must plan far into the future how we will use our natural resources.

WHAT IS YOUR ATTITUDE TOWARD SCIENCE?

(A Scientific Attitude Inventory)

There are some statements about science on the next few pages. Some statements are about the nature of science, some are about how scientists work. Some of these statements describe how you might feel about science. You may agree with some of the statements and you may disagree with others. That is exactly what you will be asked to do. By doing this, you will show your attitude toward science.

After you have carefully read a statement, decide whether or not you agree with it. If you agree, decide whether you agree mildly or strongly. If you disagree, decide whether you disagree mildly or strongly. Then, find the number of that statement on the answer sheet, and blacken the space by the

1. if you agree strongly.
2. if you agree mildly.
3. if you disagree mildly.
4. if you disagree strongly.

EXAMPLE:

00. I would like to have a lot of money.

00. 1 ■ 2 ___ 3 ___ 4 ___

(The person who marked this example agrees strongly with the statement, "I would like to have a lot of money.")

Please respond to each statement and blacken only ONE space for each statement.

WHAT IS YOUR ATTITUDE TOWARD SCIENCE?

1. I would enjoy studying science and using this knowledge in some scientific field.
2. Anything we need to know can be found out through science.
3. Scientific explanations can be made only by scientists.
4. Once they have developed a good theory, scientists must stick together to prevent others from saying it is wrong.
5. It is useless to listen to a new idea unless everybody agrees with the idea.
6. Science may be described as being primarily an idea-generating activity.
7. Scientists are always interested in improving their explanations of natural events.
8. If one scientist says a theory is true, all other scientists will believe him.
9. Science is so difficult that only highly trained scientists can understand it..
10. A useful scientific theory may not be entirely correct, but it is the best idea scientists have been able to think up.
11. We can always get answers to our questions by asking a scientist.
12. There are some things which are known by science to be absolutely true.
13. Most people are not able to understand the work of science.
14. Today's electric appliances are examples of the really valuable products of science.
15. Scientists cannot always find the answers to their questions.
16. When something is explained well, there is no reason to look for another explanation.
17. Most people are able to understand the work of science.

18. A scientific theory is no better than the objective observations upon which it is based.
19. Scientists believe that they can find explanations for what they observe by looking at natural phenomena.
20. The day after day search for scientific knowledge would become boring for me.
21. Scientific work would be too hard for me.
22. Scientists discover laws which tell us exactly what is going on in nature.
23. Scientific ideas may be said to undergo a process of evolution in their development.
24. The value of science lies in its usefulness in solving practical problems.
25. When one asks questions in science, he gets information by observing natural phenomena.
26. A good scientist doesn't have any ideas he is not willing to change.
27. Looking at natural phenomena is a most important source of scientific information.
28. Public understanding of science is necessary because scientific research requires financial support through the government.
29. Some questions cannot be answered by science.
30. Rapid progress in science requires public support.
31. Scientists do not need public support, they can get along quite well without it.
32. A scientist must be imaginative in developing ideas which explain natural events.
33. The value of science lies in its theoretical products.
34. Ideas are one of the more important products of science.
35. I do not want to be a scientist because it takes too much education.

36. There is no need for the public to understand science in order for scientific progress to occur.
37. When a scientist is shown enough evidence that one of his ideas is a poor one, he should change his idea.
38. All one has to do to learn to work in a scientific manner is to study the writings of great scientists.
39. Before one can do anything in science, he must study the writings of the great scientists.
40. People need to understand the nature of science because it has such a great affect upon their lives.
41. A major purpose of science is to produce new drugs and save lives.
42. One of the most important jobs of a scientist is to report exactly what his senses tell him.
43. If a scientist cannot answer a question, all he has to do is to ask another scientist.
44. An important purpose of science is to help man to live longer.
45. I would enjoy working with other scientists in an effort to solve scientific problems.
46. Scientific laws cannot be changed.
47. Science is devoted to describing how things happen.
48. Every citizen should understand science because we are living in an age of science.
49. I may not make many great discoveries, but working in science would still be interesting to me.
50. A major purpose of science is to help man live more comfortably.
51. Scientists should not criticize each other's work.
52. His senses are one of the most important tools a scientist has.

53. Scientists believe that nothing is known to be true with absolute certainty.

54. Scientific laws have been proven beyond all possible doubt.

55. I would like to work in a scientific field.

56. A new theory may be accepted when it can be shown to explain things as well as another theory.

57. Scientists do not have enough time for their families or for fun.

58. The products of scientific work are mainly useful to scientists, they are not useful to the average person.

59. Scientists have to study too much and I would not want to be one for this reason.

60. Working in a laboratory would be an interesting way to earn a living.

Answer the following on the paper provided and on the back of these sheets whenever possible.

1. Since the beginning of this school term to the present day how many days of field trips have you been on?

Note:

(a) Count a ½ day each time you spent 2 hours on field trip activities. Example: If you were out 18 hours in this period of time this would be 4½ days.

(b) Include as field trips any time you were outside your classroom for biology which may include trips to: a Natural History museum; a marsh; a prairie; a forest; a stream; a lake; a park; a pulp mill; a steel plant; the school yard - for the purpose of observation and/or collection of data.

2. When you went out on these trips did your teacher(s) outline the objectives for each trip?

   YES _____ NO _____

   If your answer was YES, what were these objectives (list as many as you can - ask for more paper if necessary).

   If your answer was NO - did you have any idea of what the objectives might have been, if you did, list as many as you can.

3. When you returned from these field trips were there any follow-up activities.

   YES _____ NO _____

   If your answer was YES list the things the teacher(s) and/or you did following the field trip(s).

4. State the dates of your field trips as accurately as possible.

Answer the following on the paper provided and on the back of these sheets whenever possible.

FOR COMPLETION BY THE BIOLOGY TEACHER(S):

1. Since the beginning of this school term to the present day how many days of field trips have you been on with your Grade XI class(es)? _____

   Note:

   (a) Count a ½ day each time you spent 2 hours on field trip activities. Example: If you were out 18 hours in this period of time this would be 4½ days.

   (b) Include as field trips any time you were outside your classroom for biology which may include trips to: a Natural History museum; a marsh; a prairie; a forest; a stream; a lake; a park; a pulp mill; a steel plant; the school yard - for the purpose of observation and/or collection of data.

2. When you went out on these trips did you outline the objectives for each trip to your students?

   YES _____ NO _____

   If your answer was YES what were these objectives (list all that you had - use extra paper if necessary).

   If your answer was NO - did you have any objectives for the trip(s) in your mind, if you did, list as many as you can.

3. When you returned from these field trips were there any follow-up activities?

   YES _____ NO _____

   If your answer was YES list the things you and/or you and your students do following the field trip(s) that was related to the trip(s).

4. State the dates of your field trips as accurately as possible:

   _____ _____

   _____ _____